

Amendments to the Claims:

1. (currently amended) A multi-pulse peak-hold device utilized to acquire an optical output power level of a laser diode in an optical recording apparatus, the optical recording apparatus having a photodiode for generating a sensed power level signal according to the optical output of the laser diode, the multi-pulse peak-hold device comprising:
- 5 a peak-hold circuit comprising a first input for receiving the sensed power level signal, a second input for receiving a reset signal, and an output for a peak voltage signal; and
- 10 a sample and hold circuit comprising a first input for receiving the peak voltage signal, a second input for receiving a sample and hold signal, and an output for a held power level signal utilized by the optical recording apparatus to adjust the optical output power of the laser diode;
- 15 wherein after a predetermined time period, the optical recording apparatus issues the sample and hold signal causing the sample and hold circuit to sample and hold the peak voltage signal, then the optical recording apparatus issues the reset signal to reinitialize the peak-hold circuit; and
- 20 an output signal from the sample and hold circuit is adjusted by multiplying the output signal from the sample and hold circuit with a proportional constant obtained according to an identification procedure.
2. (original) The multi-pulse peak-hold device of claim 1 further comprising a switch to control transmission of the sensed power level signal from the photodiode diode to the peak-hold circuit according to a window signal issued by the optical recording apparatus.
- 25 3. (previously presented) The multi-pulse peak-hold device of claim 2 wherein the window signal is issued by the optical recording apparatus to randomly select FPDO sequences from the FPDO pulses train.
- 30 4. (original) The multi-pulse peak-hold device of claim 2 wherein the window signal

is issued by the optical recording apparatus according to a predetermined FPDO sequence comprising fixed data patterns.

5. (original) The multi-pulse peak-hold device of claim 1 wherein the peak-hold
5 circuit acquires and outputs a maximum peak voltage occurring in the sensed power level signal within the predetermined time period.
6. (previously presented) The multi-pulse peak-hold device of claim 1 wherein the
10 peak-hold circuit acquires and outputs a minimum bottom voltage occurring in the sensed power level signal within the predetermined time period.
7. (currently amended) An optical recording apparatus having automatic power control for adjusting an optical output power level of a laser diode in the optical recording apparatus, the optical recording apparatus comprising:
15 a control circuit;
a photodiode comprising an output for outputting an optical power level signal;
a peak-hold circuit comprising an output for outputting a peak voltage signal, a first input electrically connected to the output of the photodiode, and a second input electrically connected to the control circuit for receiving a reset
20 signal from the control circuit;
a sample and hold circuit comprising an output, a first input electrically connected to the output of the peak-hold circuit, and a second input electrically connected to the control circuit for receiving a sample and hold signal;
25 a reference power level setting unit comprising an output for outputting a reference power level signal;
a feedback controller unit comprising an input and an output, the input of the feedback controller unit receiving a difference between the output of the sample and hold circuit and the reference power level signal;
30 a laser diode driving unit comprising an input electrically connected to the output of the feedback controller unit and an output electrically connected to the laser diode; and

a laser diode for radiating laser light onto an optical disc;
wherein after a predetermined time period, the control circuit transmits the
sample and hold signal causing the sample and hold circuit to sample and
hold the peak signal, the control circuit then transmits the reset signal to
5 reinitialize the peak-hold circuit; and
an output signal from the sample and hold circuit is adjusted by multiplying the
output signal from the sample and hold circuit with a proportional constant,
obtained according to an identification procedure.

10 8. (original) The optical recording apparatus of claim 7 further comprising a low-pass
filter electrically connected between the output of the photodiode and the first
input of the peak-hold circuit for alleviating noise effect on the output of the
photodiode.

15 9. (original) The optical recording apparatus of claim 7 further comprising a
feed-forward path electrically connected between the reference power level
setting unit and the feedback controller unit for speeding up transient response
from read status to write status in an APC loop.

20 10. (original) The optical recording apparatus of claim 7 further comprising a switch
electrically connected between the output of the photodiode and the first input of
the peak-hold circuit for controlling transmission of the optical power level signal
from the photodiode to the peak-hold circuit according to a window signal
transmitted from the control circuit to the switch, wherein the optical power level
25 signal is active to transmit from the photodiode to the peak-hold circuit within the
window signal and is inactive outside the window signal.

11. (original) The optical recording apparatus of claim 10 wherein the window signal
is transmitted to the switch only during a predetermined FPDO sequence
30 comprising fixed recording data patterns.

12. (original) The optical recording apparatus of claim 10 wherein the window signal

is transmitted to the switch to select random FPDO sequences from the FPDO pulses train.

13. (original) The optical recording apparatus of claim 7 wherein the peak-hold circuit
5 acquires and outputs a maximum peak voltage occurring in the optical power level signal within the predetermined time period.

14. (original) The optical recording apparatus of claim 7 wherein the peak-hold circuit
10 acquires and outputs a minimum bottom voltage occurring in the optical power level signal within the predetermined time period.

15. (currently amended) An optical recording apparatus having automatic power control for adjusting an optical output power level of a laser diode in the optical recording apparatus, the optical recording apparatus comprising:
15 a control circuit;
a photodiode comprising an output for outputting an optical power level signal;
a peak-hold circuit comprising an output for outputting a peak voltage signal, a first input electrically connected to the output of the photodiode, and a second input electrically connected to the control circuit for receiving a reset
20 signal from the control circuit;
a sample and hold circuit comprising an output, a first input electrically connected to the output of the peak-hold circuit, and a second input electrically connected to the control circuit for receiving a sample and hold signal;
25 a reference power level setting unit comprising an output for outputting a reference power level signal;
a feedback controller unit comprising an input and an output, the input of the feedback controller unit receiving a difference between the output of the sample and hold circuit and the reference power level signal;
30 a laser diode driving unit comprising an input electrically connected to the output of the feedback controller unit and an output electrically connected to the laser diode; and

the a laser diode for radiating laser light onto an optical disc;
wherein after a predetermined time period, the control circuit transmits the sample and
hold signal causing the sample and hold circuit to sample and hold the peak signal,
the control circuit then transmits the reset signal to reinitialize the peak-hold
5 circuit; and
an output signal from the sample and hold circuit is adjusted by multiplying the output
signal from the sample and hold circuit with a proportional constant approximately
equal to the inverse of the ratio of measured power to real power, the ratio
obtained in an identification procedure.
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16. (currently amended) An optical recording apparatus having automatic power
control for adjusting an optical output power level of a laser diode in the optical
recording apparatus, the optical recording apparatus comprising:
a control circuit;
15 a photodiode comprising an output for outputting an optical power level signal;
a peak-hold circuit comprising an output for outputting a peak voltage signal, a
first input electrically connected to the output of the photodiode, and a
second input electrically connected to the control circuit for receiving a reset
signal from the control circuit;
20 a sample and hold circuit comprising an output, a first input electrically
connected to the output of the peak-hold circuit, and a second input
electrically connected to the control circuit for receiving a sample and hold
signal;
a reference power level setting unit comprising an output for outputting a
25 reference power level signal;
a feedback controller unit comprising an input and an output, the input of the
feedback controller unit receiving a difference between the output of the
sample and hold circuit and the reference power level signal;
a laser diode driving unit comprising an input electrically connected to the
30 output of the feedback controller unit and an output electrically connected to
the laser diode; and
the a laser diode for radiating laser light onto an optical disc;

- wherein after a predetermined time period, the control circuit transmits the sample and hold signal causing the sample and hold circuit to sample and hold the peak signal, the control circuit then transmits the reset signal to reinitialize the peak-hold circuit; and
- 5 the reference power level signal is adjusted by multiplying reference power level signal with a proportional constant approximately equal to a ratio of measured power to real power, the ratio obtained in an identification procedure.
17. (previously presented) The optical recording apparatus of claim 16 wherein the
10 input to the feedback control unit is adjusted by multiplying the input to the feedback control unit with a proportional constant approximately equal to the inverse of the ratio obtained in the identification procedure.
18. (currently amended) A method for measuring an optical output power level of a
15 laser diode in an optical recording apparatus, the method comprising:
utilizing a photodiode to generate a sensed power level signal according to the optical output of the laser diode;
utilizing a peak-hold circuit to acquire, hold, and output a maximum voltage of the sensed power level signal;
20 utilizing a sample and hold circuit to sample and hold the output of the peak-hold circuit after a predetermined time period according to a signal received by the sample and hold circuit from the optical recording apparatus;
reinitializing the peak-hold circuit after the output of the peak-hold circuit has
25 been sampled and held by the sample and hold circuit; and
adjusting an output signal from the sample and hold circuit by multiplying the output signal from the sample and hold circuit with a proportional constant
obtained according to an identification procedure.
- 30 19. (original) The method of claim 18 further comprising alleviating noise effects on the output of the photodiode utilizing a low-pass filter between the photodiode and the peak-hold circuit.

20. (original) The method of claim 18 further comprising speeding up the transient response from read status to write status in an APC loop by a feed-forward path from a reference power level setting unit to a feedback controller unit.
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21. (original) The method of claim 18 further comprising controlling transmission of the sensed power level signal from the photodiode diode to the peak-hold circuit with a switch according to a window signal issued by the optical recording apparatus, wherein the sensed power level signal is active to transmit from the photodiode to the peak-hold circuit within the window signal and is inactive outside the window signal.
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22. (previously presented) The method of claim 21 further comprising transmitting the window signal from the optical recording apparatus to the switch to select a random FPDO sequence from a FPDO pulse train.
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23. (original) The method of claim 21 further comprising transmitting the window signal from the optical recording apparatus to the switch during a predetermined FPDO sequence comprising fixed recording data patterns.
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24. (original) The method of claim 18 wherein the peak-hold circuit acquires and outputs a maximum peak voltage occurring in the sensed power level signal within the predetermined time period.
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25. (original) The method of claim 18 wherein the peak-hold circuit acquires and outputs a minimum bottom voltage occurring in the sensed power level signal within the predetermined time period.
- 26-30. (cancelled)
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31. (new) An automatic power control system of an optical recording apparatus for adjusting an optical output power level of a laser diode in the optical recording

apparatus, said optical recording apparatus further including a photodiode having an output for outputting an optical power level signal; the automatic power control system comprising:

a control circuit;

5 a peak-hold circuit comprising an output for outputting a peak voltage signal, a first input electrically connected to the output of the photodiode, and a second input electrically connected to the control circuit for receiving a reset signal from the control circuit;

10 a sample and hold circuit comprising an output, a first input electrically connected to the output of the peak-hold circuit, and a second input electrically connected to the control circuit for receiving a sample and hold signal;

a reference power level setting unit comprising an output for outputting a reference power level signal;

15 a feedback controller unit comprising an input and an output, the input of the feedback controller unit receiving a difference between the output of the sample and hold circuit and the reference power level signal; and

20 a laser diode driving unit comprising an input electrically connected to the output of the feedback controller unit and an output electrically connected to the laser diode;

wherein after a predetermined time period, the control circuit transmits the sample and hold signal causing the sample and hold circuit to sample and hold the peak signal, the control circuit then transmits the reset signal to reinitialize the peak-hold circuit; and

25 an output signal from the sample and hold circuit is adjusted by multiplying the output signal from the sample and hold circuit with a proportional constant approximately equal to the inverse of the ratio of measured power to real power, the ratio obtained in an identification procedure.

30 32. (new) An automatic power control system of an optical output power level of a laser diode in the optical recording apparatus, said optical recording apparatus further comprising a photodiode comprising an output for outputting an optical

- power level signal; the automatic power control system comprising:
- a control circuit;
 - a peak-hold circuit comprising an output for outputting a peak voltage signal, a first input electrically connected to the output of the photodiode, and a second input electrically connected to the control circuit for receiving a reset signal from the control circuit;
 - a sample and hold circuit comprising an output, a first input electrically connected to the output of the peak-hold circuit, and a second input electrically connected to the control circuit for receiving a sample and hold signal;
 - a reference power level setting unit comprising an output for outputting a reference power level signal;
 - a feedback controller unit comprising an input and an output, the input of the feedback controller unit receiving a difference between the output of the sample and hold circuit and the reference power level signal; and
 - a laser diode driving unit comprising an input electrically connected to the output of the feedback controller unit and an output electrically connected to the laser diode;
- wherein after a predetermined time period, the control circuit transmits the sample and hold signal causing the sample and hold circuit to sample and hold the peak signal, the control circuit then transmits the reset signal to reinitialize the peak-hold circuit; and
- the reference power level signal is adjusted by multiplying reference power level signal with a proportional constant approximately equal to a ratio of measured power to real power, the ratio obtained in an identification procedure.
33. (new) The automatic power control system of claim 16 wherein the input to the feedback control unit is adjusted by multiplying the input to the feedback control unit with a proportional constant approximately equal to the inverse of the ratio obtained in the identification procedure.
34. (new) The multi-pulse peak-hold device of claim 1, wherein the proportional

constant is approximately equal to an inverse of a ratio of measured power to real power, the ratio being obtained in the identification procedure.

5 35. (new) The optical recording apparatus of claim 7, wherein the proportional constant is approximately equal to an inverse of a ratio of measured power to real power, the ratio being obtained in the identification procedure.

10 36. (new) The method of claim 18, wherein the proportional constant is approximately equal to an inverse of a ratio of measured power to real power, the ratio being obtained in the identification procedure.